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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/601,912	12/01/2000	Vasilios Kanellopoulos	6-1034-040	5277

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HENDERSON & STURM LLP
1213 MIDLAND BUILDING
206 SIXTH AVENUE
DES MOINES, IA 50309-4076

EXAMINER

WYROZEBSKI LEE, KATARZYNA I

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 03/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/601,912		KANELLOPOULOS ET AL.	
	Examiner		Art Unit	
	Katarzyna Wyrozebski Lee		1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

In the light of the applicant's amendment filed on 2/15/2003 following non-final office action is necessitated

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites that the phenolic resin may contain moieties of general formula A. With respect to the above limitation, term "may" renders claim indefinite, since it is not clear if the phenolic resin actually contain phenolic moieties of formula A or not. In addition, "n" in claim 3 is not defined.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 5-7 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Iimuro (US 5,123,349).

The example 3 of the prior art of Iimuro discloses composition for a binder utilized in friction materials. The composition of example 3 comprises NOVOLAK resin, epoxidized silicon oil and organopolysiloxane having terminal silanol groups. The mixture is then mixed and in presence of curing accelerator (in other examples it is hexamethylene tetramine) the binder is cured.

Although the prior art of Iimuro does not explicitly disclose that the reaction between phenolic resin and the silanol groups occur, such process is inherent for the following reason. Examples also disclose that during the course of reaction water is produced. Unnecessary water is removed *via* vacuum dehydration. Knowing that the components at issue have functional groups of –OH in phenolic resin, epoxy and –OH in silanol, one of ordinary skill in the art would know that water would not be produced during reaction between –OH group and epoxy. Water will be produced in the prior art of Iimuro, when two –OH groups are reacting. In addition, throughout the examples, Iimuro refers to the reaction as crosslinking reaction. Therefore, the

silanol groups do react with phenolic resin while small amounts of hexamethylene tetramine is utilized simply to catalyze the reaction.

According to the prior art of limuro, organopolysiloxane contains hydrocarbon substituents, which include phenyl and xylyl group known as dimethyl benzene.

In the process of limuro, condensation of components occurs at 170°C, crosslinking reaction at 170°C and post kneading at a temperature range of 110-120°C. The resulting composition is then crushed to give powder having particle size of 0.1-10 microns. The powder is molded into specimens at 170°C and pressure of 100 kg/cm² then the specimens are placed in oven at 400°C.

In the light of the above disclosure, the prior art of limuro anticipates the requirements of claims rejected above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1714

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 2-4, 8-11, 15-20 rejected under 35 U.S.C. 103(a) as being unpatentable over Iimuro (UR 5,123,349) in view of Kane (US 5,736,619).

The discussion of the disclosure of the prior art of Iimuro from paragraph 5 of this office action is incorporated here by reference.

In addition to the discussion in paragraph 5, the prior art of Iimuro discloses that the temperature in which crosslinking reaction can be carried out is in a range of 60-200°C.

Therefore it would have been obvious to one having ordinary skill in the art to utilize temperature within a range taught by the prior art of Iimuro.

The difference between the present invention and the disclosure of the prior art of Iimuro is recitation of different temperature ranges and other phenolic monomers, which can be utilized to make friction binders.

With respect to the above differences, the prior art of Kane teaches another friction composition in combination with organosiloxanes having silanol groups.

The phenolic resin of the prior art of Kane teaches phenolic monomer (col. 9 and 10), which contains non-aromatic alcoholic group HOCH_2 - required by the claims of the present invention. Resulting phenolic resin is either RESOLE or NOVOLAK.

As the Abstract of Kane discloses to facilitate condensation of phenolic resin, small amount of catalyst and silanol compound can be added. Reaction schemes number 4 and 5 further discloses a reaction between silane component and phenolic resin (col. 18). It is also stated in col. 18, lines 22-25 that silanol group of the silanol functional intermediate also reacts with phenolic methylol groups.

The prior art of Kane also teaches that the phenolic binders can be utilized with epoxy binders to optimize chemical resistance and avoid corrosion. Although no specific example having epoxy resin is disclosed, such modification would be obvious in view of the above teaching.

The preferred curing catalyst in the prior art of Kane is also hexamethylene tetramine although other amines are not excluded.

In the process of the prior art of Kane, the compositions are mixed at room temperature in plastic beaker than transferred into steel mold. The composition is then cured at a temperature of 65°C, heated after curing at 120°C, cut into bars and further cured at 70°C. At the end samples are dried at 120°C.

Although the prior art of Kane does not teach degassing step in the process such step is obvious. During reaction, which occurs while making the compositions of the prior art, a volatile matter is generated and needs to be evacuated. One can reduce pressure in order to minimize the amount of the volatile nitrogen produced. Support for such allegation can be found in Kakegawa (US 5,889,084 examples).

Composition, which can be produced from phenolic binders made from various type of phenolic monomers disclosed in the prior art of record can be utilized in making friction materials, that have good chemical resistance and improved corrosion resistance and which can be cured over various temperatures.

In the light of the above disclosure, it would have been obvious to one having ordinary skill in the art at the time of the instant invention, to utilize the phenolic resins having monomers as disclosed in Kane in the composition of Iimura and then cure the composition at lower temperature and thereby arrive at the present invention. Such modifications to the prior art of Iimura would still arrive at efficient friction composition.

In the amendment filed on January 15, 2003 the applicant argued following:

a) The prior art of Iimuro states that the reaction of the silanol groups takes place in the phenol-based resin. It does not state that the reaction is with the phenol-based resin.

With respect to the above argument, the prior art of Iimuro does not specifically say that the silanol groups react with phenolic resin, however, such will inherently occur as discussed in a rejection in paragraph 5 above.

b) Iimuro does not address the water absorption problem in friction element.

Properties such as water absorption are inherent properties of the composition, if the compositions are determined to be approximately the same. Furthermore, water absorption is not an issue in the present claims.

c) Iimuro teaches use of organotin as catalyst for silanol condensation

Yes, but the examiner does understand where the question is.

d) Iimuro teaches phenol-based resin such as NOVOLAK formed by reacting one or more phenolic compounds with aldehydes.

Yes, that is how phenolic resins are made.

e) The composition of Kane is interpenetrating network between the phenolic compound and silane compound.

Please see reaction schemes 4 and 5 as discussed in rejection above. The reaction schemes clearly indicate reaction between silanol and phenolic groups.

f) The reaction of silanol groups with phenolic –OH groups is theoretical possibility in the prior art of Kane.

Please see response to the argument e).

g) The limitation of “n” in claim 3 is in fact defined, in view of the fact that the specification discloses tradename of Xylox. Therefore the range of n would be determined.

Since the manufacturer is under no obligation to continue making the same material under given trademark nor continue to selling anything under given trademark. The discontinued use of trademarks or changing of the material sold under the trademark renders the claim meaningless. See MPEP 608.01 (v). Therefore, the limitation of “n” is not defined.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katarzyna Wyrozebski Lee whose telephone number is (703) 306-5875. The examiner can normally be reached on Mon-Thurs 6:30 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (703) 306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Application/Control Number: 09/601,912

Page 10

Art Unit: 1714

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Katarzyna Hynobler

KIWL

March 14, 2003